Folios: Status & Projected Landing

Some of these patches are outside of Arm's control: projected versions are not guaranteed

Allocation & Maintenance of Large Folios

+ Anonymous Memory
  - Multi-Size THP: in v6.8-rc1
+ File-backed Memory
  - Generic parts support large folios since ~v6.1; XFS, AFS, EROFS, tmpfs filesystems well supported
  - Ext4 conversion in progress: 1 (no clear landing date)
  - Other FSs and relations require attention (e.g. fsverity, f2fs, overlayfs)
+ Large folio compaction: in v6.9-rc1
  - Move large folios to defrag PA space
+ Swap
  - Ensure large folios do not get split by swap; would prevent contpte mapping after swapping back in
  - Swap-out estimate: v6.10 1
  - Swap-in estimate: v6.10-v6.11 2

CONTPTE Enablement

+ contpte: in v6.9-rc1
  - arm64 changes to detect contiguous mappings and manage contpte bit
+ exefolio: Aiming for v6.11: 1
  - Optimize readahead for executable segments to ensure they are in contpte-mappable large folios

Future

+ Fragmentation Analysis
  - could be issue in long run; Data needed to understand scale of problem
+ Khugepaged-like mechanism to collapse to mTHP sizes
  - Useful to fix CoWed pages, etc
  - Anticipate less complex and costly than traditional khugepaged since can all be done with only the PTLock
+ Per-VMA automatic anon folio size determination
  - Heuristics for dynamic selection of folio size to tune perf vs internal fragmentation trade-off

arm